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Title of the Thesis

GEOTOURISM: A PERSPECTIVE FROM SOUTH-WESTERN DISTRICTS OF WEST BENGAL

CONCEPTUAL FRAMEWORK:

The relatively new concept geotourism is now very well known and growing rapidly all over the world. Geotourism is defined as the provision of interpretative facilities and services to promote the value and societal benefit of geological and geomorphological features/ sites/processes and their materials to ensure their conservation as well as to ensure their societal and economic values satisfying tourists and other recreationalists (Hose, 2000). The term "sustainable tourism" has a deep relation with the concept of geotourism (Farsani, *et al.*, 2009). Geotourism is sustainable tourism energized. Actually Geotourism is a holistic approach to sustainable tourism which may focus on all those components that create an authentic travel experience (Stokes, *et al.*, 2003). According to Boley (2009), the aim of geotourism is to preserve the geographical character of the destination which differentiates it from other types of sustainable tourism. It is beneficial for both the visitors and local communities because it provides visitors with an authentic experience while the destination's unique virtues are preserved. By accentuating the unique features of the travel destination, geotourism ideally should provide a tourism industry that protects the region's identity while providing an authentic travel experience.

There are five key principles which are fundamental to geotourism, namely that

1. geotourism is geologically based (that is based on the earth's geoheritage),
2. Sustainable (i.e., economically viable, community enhancing and fosters geoconservation),
3. Educative (achieved through geo-interpretation),
4. locally beneficial and
5. generates tourist satisfaction.

The first three characteristics are considered to be essential for a product to be considered "geotourism" while the last two are viewed as being desirable for all forms of tourism.

As a holistic form of sustainable tourism, geotourism incorporates various types of sustainable tourism segments such as nature tourism, ecotourism, integrated rural tourism, cultural and heritage tourism and as well as community-based tourism. Geotourism desires to experience pristine natural areas without negative impact on the earth heritage. The three main principles of sustainable development i.e. ecological, social and economic issues may also be applied to regional geotourism development planning (Dowling, 2009). Geotourism will only be sustainable where the local community will be benefited and these may be social and/or cultural, and environmental and will not necessarily be confined to economic benefits (Dowling, 2009). Geotourism is a tool for rural development, local community participation and poverty alleviation (Ngwira, 2015). Geotourism has the potentiality to contribute sustainable rural development and poverty alleviation of the backward area. It has great opportunity to help in the global fight against poverty (Dowling, 2009a; Farsani, *et al.*, 2009). Geotourism is seen to provide opportunities for socio-economic development in various ways, particularly in rural areas (Farsani, *et al.*, 2011) Geotourism development also represents a partnership between government, local people and private sectors, local businesses, outdoor companies, tour agencies, restaurants, and accommodation facilities, among others. This partnership is welcomed because it makes good economic sense and can benefit all partners (Dowling, 2009a). Geotourism have enhanced employment opportunities of the local people. Geotourism has also fostered an

education regime which includes a number of tools and activities which communicate geoscientific knowledge and environmental concepts to the visitors and the local community.

Sustainable conservation and management of earth natural and cultural heritages would not possible without Participation of local people. Thus community-based strategy is highly recommended for the management and operation of geotourism. This can be achieved by organizing these communities, educating them about the benefits of geotourism, building their capacity to accommodate geotourists, and employing them in geotourism operations (Aquino, 2016). Geotourism protects earth heritage, helps build communities, communicates and promotes geosites and works with a wide range of different people (Dowling, 2009a). It also involves the community when a combination of local businesses and civic groups work together to promote and provide distinctive, authentic visitor experiences. Geotourism may also provide economic and other benefits to local residents such as job creation and income generation as well as added services, products and supplies. When the local community understands the beneficial role of geotourism it becomes an incentive for wise destination stewardship (Dowling, 2009a). Community involvement in tourism has increased due to its perceived local economic, social and conservation benefits (Ashley and Roe, 1998). Geotourism development offers local residents income generation, jobs and skill development (Farsani, *et al.*, 2011). Thus geotourism may be viewed as a way in which geology can be conserved and managed, largely through the efforts of local people and other stakeholders. In the development of geotourism there can be a number of stakeholders involved but with each holding a different perspective on the specifics of development. For example, community-based geoheritage management projects may combine both the conservation and development aspects to varying degrees. The involvement of local communities not only benefits the community and the environment but also improves the quality of the tourist experience. Satisfaction of visitors with the geotourism experience is essential to the long-term viability of the geotourism industry. Local communities can become involved in geotourism operations, and in the provision of knowledge, services, facilities and products. Geotourism can also generate income for resource conservation management in addition to social and cultural benefits.

Another key issue is that of environmental (ecological, cultural, and economic) sustainability. Since the natural environment underpins geotourism, it is essential that it be protected and

conserved. Geotourism activity that degrades the environment, adversely affects the local community or fails to return worthwhile economic benefits, is not sustainable in the long term. Thus it is important that geotourism operators undertake best practice methods to minimise adverse environmental impacts caused by visitor activity, transport and facility use. In addition the need for environmental protection provides a compelling argument for governments to put more money and resources into geological conservation and protection. The locals' knowledge and traditional style of their life play a vital role in environmental management. Geotourism motivates the local people to effectively participate in achieving sustainable development and sustainable tourism.

The following concepts are vital in understanding, analyzing and managing geotourism:

a) Geodiversity and its valuing: Geodiversity is a very a useful concept for geoconservation and management of abiotic heritage. Geodiversity refers to the diversity of minerals, rocks, fossils, soils, landforms and geological processes that constitute the topography, landscape and the underlying structure of the Earth. The geodiversity concept first emerged in the early 90's and it was defined as "the diversity of Earth features and systems" (Sharples, 1993). Later, the definition was elaborated and it included ''the range or diversity of geological (bedrock), geomorphological (landform) and soil features, assemblages, systems and processes" (Sharples, 1995; Dixon, 1996; AHC, 2002). Gray (2004) defined geodiversity is the natural range or diversity of geological (rocks, minerals, fossils), geomorphological (land form, processes) and soil features, including their assemblages, relationships, properties, interpretations and systems.
Geodiversity is closely related to the concepts of geoconservation, natural heritage, geoheritage, geoparks, protected landscapes, natural monuments or geomorphosites. Actually, Geodiversity refers to the diversity of minerals, rocks, fossils, soils, landforms and geological processes that constitute the topography, landscape and the underlying structure of the Earth. The degree of geodiversity depends upon the range of geological, geomorphological and paleontological features relative to the region or area discussed. A relatively higher (richer) geodiversity occurs in those areas which are characterized by the occurrence of complex geological structures formed in differing geological eras. A relatively lower diversity occurs in larger areas of similar geological structures like deserts area.

The importance of geodiversity can be represented by multiple values that are important for human activities (Gray, 2004):

• Intrinsic value is also called scientific value. It in depends on the human's evaluation, (Panizza, 2009);

• Cultural value refers to historical and archaeological, spiritual and religious aspects of geodiversity, aspects.

• Aesthetic value refers to visual and non-visual appeal provided by geodiversity including a psychological impact on human beings (Gray, 2004).

• Economic and functional value is represented by the utilisation of geodiversity mainly for geotourism activities.

• Research and educational value refers to the understanding of the origin and evolution of the landscape and climate and palaeogeographic reconstructions (Gray, 2004; Panizza, 2001).

b) Geosite and Geomorphosite: The geosites are defined as portions of the geosphere that present a particular importance for the comprehension of Earth history, geological or geomorphological objects that have acquired a scientific, cultural/historical, aesthetic and/or social/economic value due to human perception or exploitation (Reynard, 2004). The geosites are classified as lithological sites, stratotypes, geosystems, geological or geomorphological landscapes, caves and grottos, mineral sites, historical mine sites, fossil sites, meteorite impacts, geological environment that supports an ecosystem.

Geomorphosites are the landforms to which a value can be attributed and they can be used by society as a geomorphological resource (Panizza, 2001). Geomorphosites can be considered as one of the multiple types of the geosites and they are defined as landforms that have acquired a value thanks to human perception (Panizza, 2001). These values were divided into two groups which are described as follows (Reynard, *et al.*, 2009):

1) Scientific values that present an importance for understanding of a form, process or evolution. The important scientific values of a geomorphologic site are its form, process, uniqueness and palaeogeographical significance of the site.

2) Additional values include cultural, aesthetic, ecological and economic/social values. The cultural value is represented by the archaeological or historic significance of the site which is somehow related to the geological and geomorphological features and processes of the site. The aesthetic value is based on the colour contrast, the structure of the space or heterogeneity of the site. The economic or social value is related to the potential for the use of the site especially for geotourism; the exploitation of geosites and geomorphosites, especially for tourism activities. The ecological value expresses the relation between geomorphologic elements of the site and biota and the influence of geomorphosite on the development of an ecosystem; it can also include the presence of specific or rare species or biodiversity value.

c) Geoheritage and Geoconservation: Geological heritage (geoheritage) refers to the heritage of geology and the various products thereof. The term geoheritage was defined as those components of natural geodiversity of significant value to humans, including scientific research, education, aesthetics and inspiration, cultural development, and a sense of place experienced by communities (Dixon, 1996). Sharples (2002) says that geoheritage is represented by those elements of natural geodiversity which are of significant value to humans for non-depleting purposes which do not decrease their intrinsic or ecological values. Geoheritages are those features and processes of the earth which are worth of protection and conservation. Sharples strictly distinguishes between the term "geodiversity" as a value-free quality, and "geoheritage" as those elements of geodiversity that are seen as significant according to particular subjective values (Sharples, 2002).

Geoconservation refers to the conservation of geodiversity for its intrinsic, ecological and (geo)heritage values (Sharples, 1995). Geoconservation can be described as an activity of humans which is oriented to the conservation of geoheritage and which aims to preserve the natural diversity of significant geological (bedrock), geomorphological (landform) and soil features and processes, and to maintain natural rates and magnitudes of change in those features and processes (Sharples, 2002). Geoconservation was defined as the "protection and management of geological sites, areas and specimens for scientific research, education and training, where appropriate, popularization of the Earth's history for a wider public and promotion of good conservation practice" (ProGeo, 2011). Generally speaking, it can be defined

as the intent to conserve, monitor and enhance geological and geomorphological features, processes, sites and specimens (Burek and Prosser, 2008).

Gray (2004) addressed some conclusions about valuing and conserving geodiversity:

• The Earth has not only a huge biodiversity, but also an enormous geodiversity, and this diversity is of value both intrinsically and in utilitarian ways that are barely appreciated by human beings.

• It is not necessary to conserve all the geodiversity of the planet, only those elements which are considered as being significant for one or more of their values. These elements of total geodiversity are known as the geoheritage.

• These geoheritages are facing significant threats from a variety of human activities either directly or through influencing the rates of operation of earth surface processes. Different aspects of geodiversity vary in their sensitivity and vulnerability to different types of threats.

• Protection of geoheritage is a difficult task involving many actions like boundary identification, site documentation monitoring and enforcement. At present most countries recognized the aim of geoconservation and some countries have already started the process of geoconservation for maintaining a representative sample of a country's or area's geodiversity.

• Proper knowledge and understanding is utmost important to protect and conserve the geodiversity because without knowledge and understanding it is not possible.

• Geoconservation should be established as an independent subject in its own right and to be integrated with wildlife conservation in a more holistic approach to nature conservation, and even beyond that, to develop comprehensive and sustainable land use management and natural resource strategies.

OBJECTIVES: The following objectives are taken for this study;

1. To identify and map the potential geotourism sites in the study area.

2. To enumerate their vulnerability status analyzing the anthropocentric impacts particularly.

3. To study the scope of geoconservation to restore significant, unique and rare geodiversity to achieve one of the Sustainable Development Goals (SDG).

4. To establish link between geomorphosites and tourism industry for utilization their economic value in term of employment and income.

5. To enhance education in understanding geoheritages and involving community in their protection as management strategy.

METHODOLOGY:

The methodology of the present study is both statistical and cartographic. Extensive field survey will be conducted for this study. For identification and mapping the potential geotourism sites, satellite imagery, toposheet analysis, DEM analysis and Instrumental field survey will be done. Various models and techniques will be used to analysis vulnerability status of these geotourism sites and to forecast their stability. The community-based management strategy will be taken for proper management and conservation of significant, unique and rare geodiversity to achieve Sustainable Development Goals (SDG).

The study will cover both analytical and non-analytical part. SPSS Software (Latest Version) and Microsoft Excel will be used to tabulate and analyze the data. Also, using the GIS approach, various types of maps will be generated to fulfill the objectives of research. The GIS approach will be applied with the help of QGIS software's which is basically an image processing software as well as GIS software. Field visit and survey with GPS receiver helps to generate the DEM. SURFER6 software and TAS software will be used for different morphometric analyses. From different internet sites such as Bhuvan, USGS, GLCF, Earth Explorer and Google Earth high resolution satellite images will be collected. Various cartographic techniques will also be adopted for the visual representation of the data. The methodology of the present study thus integrates the conventional and modern techniques available for spatial analysis.

SELECTION OF THE STUDY AREA:

The state of West Bengal with an area of about 87,616 sq. km. lies between the geographical coordinates of 21 ° 38' N - 27° 10' N and 85° 49' E - 89° 50'E and is divided primarily into three geomorphological regions, viz., (i) Extra-peninsular region of the north (ii) Peninsular mass of the southwest, and (iii) Alluvial and deltaic plains of the south and east (G.S.I., 1974). Among these regions, the southwestern part of west Bengal is selected as the study area. The area constitutes a rolling upland with the presence of several hills and virtually an extension of the Chhotonagpur plateau. The area under consideration lies between 85°49' E and 88°25' E longitude and 24°35' N to 21 °47' N latitude. The area consists of total six districts, namely, Puruliya, Bankura, Paschim Bardhaman, Birbhum, Jhragram and Paschim Medinipur, covering an area of approximately 25415 sq. km. It is bounded by Jharkhand in the northwest and west, Orissa in southwest, East Medinipur district in the south and, East Medinipur, Hugli, Nadia and Murshidabad districts in the east.

The southwestern region of West Bengal is an eastward extension of Chhotonagpur plateau that ultimately merges with the Gangetic plain. The area is generally undulating with hillocks in between and is traversed by a number of rivers and their tributaries. The major rivers are Subarnarekha, Kansai or Kansabati, Silai or Silabati, Dwarakeswar, Damodar, Ajay and Mayurakshi. Geomorphologically, the study area is characterized by floodplains, upland plains, badlands, duricrust, paradeltaic fan surfaces, pediments, pediplains, ridges and hills.The South-Western part of West Bengal is geomorphologically very significant with presence of a number of potential geosites and geomorphosites suitable for geotourism development.

Sl No.	Name of Geotourism site	District	Significance/description on its attraction
1	Ajodhya hill	Purulia	Ajodhya hill (2220 ft) is a part of the Dalma hills and extended part of Eastern Ghats range. Highest peak of Ajodhya hills is Gorgaburu. Turga and Bamni are two beautiful falls located here. It is a popular destination for mountaineers starting up in rock climbing. It is great spot

			for trekking in the deep forests, witness some wildlife, bird-watching and to experience local tribal culture. Presence of many hills and hillocks, falls, rivers make this place significant for geotourism development.
2	Biharinath hill	Bankura	Biharinath hill (1,480 ft) is the tallest and thick forest areas of Bankura District. It is a part of the Eastern Ghats. It is known as the Araku Valley of West Bengal. This place has hills, dense forests with abundant flora and fauna, spring, water bodies, Damodar River and a renowned old Shiva temple popularly known as the Biharinath dham. A small tank located at the foothill provides facilities for angling and boating. The tourists can enjoy a nature walk (hiking) along the scenic natural landscape. In the perspective of archaeological direction, the hill area is very important. Many Paleolithic artifacts are discovered in the vicinity of the hill area. Biharinath is an ideal destination for adventure lovers.
3	Susunia hill	Bankura	Susunia hill (1,450 ft) is a monadnock type residual hill. Susunia hill is famous for its holy spring, its natural beauty, its rich flora and the rock faces on which many of the famous mountaineers started their journey. The Gandeshwari River flows down the Susunia Hill and one of the tributaries of the Darakseshwar River. The hill is potential for many adventurous geotourism activities like Rock climbing, trekking and hiking (nature study walk). It is one of the renowned archaeological and paleontological sites in Bankura district yielding stone age tools (Mukherjee *et al.* 2012). Many animal fossils were discovered at Susunia.
4	Panchet hill	Purulia	The Panchet hill (1,610 ft) is dotted with tropical trees and looks lash green in rainy season. Damodar river flows at

			the foot of the hill. The region had a rich culture and religious past. There are scattered ruins of many terakotta style temples around Garpanchkot. Panchet dam is located here. The dam gives facilities for angling, boating to visitors.
5	Joychandi Pahar	Purulia	Joychandi hill (509 ft), 4 km from Raghunathpur is residual hill. The area forms the lowest step of the Chota Nagpur Plateau. The general scenario is undulating land with scattered hills. Rock climbing is the major attraction. The famous Bengali film 'Hirak Rajar Deshe' which was directed by Satyajit Ray, was mostly shot in this mountain area.
6	Ghoramara Pahar	Purulia	Ghoramara Pahar acts as a watershed between the Damodar and the Subarnarekha rivers. Its ridge lines have an east to west strike. Its average altitude is more than 600 meters. Many small picks are there. The Jabarban peak is the place of origin of the southeast flowing Kangsai Nala which becomes Kasai Nadi after receiving the combined waters of Girgiri Nala and Sahar Jore 3 Km north of Begunkudar.
7	Koro hill	Bankura	Koro hill (400 feet) is a potential geotourism site for its natural beauty. The hill and its surroundings are considered as good for sightseeing purpose. There is a big temple located at the top of the hill.
8	Masak hill	Bankura	Masak hill (112 ft.) near Khatra is a very beautiful natural site. At the top of the hill, there is a big cave. Many archaeological tools were found near the cave. Many saints came this place for meditation.
9	Mama Bhagne Pahar	Birbhum	Mama Bhagne Pahar is a pair of almost spherical natural boulders of granite rock, one balancing on the top of other. It is the extreme eastern part of the Chota Nagpur plateau.

			Plenty of stones of various sizes are scattered there. At the base of the rocks is a temple of Shiva entitled Pahareswar.
10	Gangani	Pachim Medinipur	Ganganir Danga is one of the most extensive badland areas. It is also called *Grand canyon of Bengal*. The area is covered by 3.5 km2 of Pleistocene lateritic upland, and is noted for spectacular ravine development on the concave right (northern) bank of river Silai. The place got this beauty through years of soil erosion with the assistance of the river. During monsoon season the river flows through the gorge & the entire stretch becomes picturesque.
11	Rangamati	Pachim Medinipur	Rangamati badland topography area is located at the left bank of the Cossi (Kansai) river. The landscape is characterized by hard rock up-lands, rill and gully, barren lateritic covered area. The area consists of tertiary and secondary lateritic, sands, silts and clay.
12	Sinhati	Bankura	Sinhati area is a localized badland topography, has developed over the Pleistocene lateritic sediments on the left bank of the River Birai, a tributary of the Dwarakeshwar River. Typical micro and meso scale landforms such as escarpment, cliff, duricrust, rills and gullies, gully fans are also found. The traditional fish breeding practice makes this badland the most revenue-earning site of the area, which marks it an exception against the general perception of nonproductive badlands.
13	Khoai, Santiniketan	Birbhum	Khoai is a geological formation of small canyons resulting from constant erosion caused by wind and water. The Khoai region is characterised by a patch of dry forest of Sonajhuri (Acacia Auriculiformis) trees on an eroded landscape of red laterite soil. With a thick cover of forest on all sides, Khoai draws tourist for its curious canyon-

			like formation made by wind and the Kopai river. Shanibarer Haat (Saturday Weekely Market) is one of the prime attractions of staying at Khoai. The weekly market officially known as "Khoai Boner Annya Haat" is a platform for local artisans and small goods traders to showcase their works.
14	Mukutmanipur	Bankura	Mukutmanipur is located at the confluence of the Kangsabati and its tributary Kumari rivers in bankura district. With hills and forests surrounding a huge water body that changes its color in different seasons, Mukutmanipur is the right place for those who are looking for some adventure along with relaxation. Apart from this, Mukutmanipur is a renowned archaeological sites.
15	Kankrajhor	Jhargram	Kankrajhor is well-known for its hilly station, sylvan forest, streams, cascades and wildlife. This place may attract visitors for its serenity, uneven geology, falls, streams, differing vegetation, thick vegetation and so forth. So, it is an outright enjoyment for nature lovers. Bamni Falls stays one of the significant attractions of this spot.
16	Hatibari	Jhargram	Hatibari is an amazing rivirine tourism sites located on the bank of river Subarnarekha. The place is surrounded by small hills and lush greenery. The outstanding scenic beauty of Subarnarekha river surrounded by forest on both sides is the major attraction of this place.
17	Gopiballavpur	Jhargram	Gopiballavpur is situated at the banks of the Subarnarekha River. The combination of river with dense forest in its bank creates an awesome look for the visitors. An Ecopark has been newly constructed in the bank of the river Subarnarekha to attract people. Jhilli dam is another beautiful tourism site near Gopiballavpur.

18	Belpahari	Jhargram	Belpahari is a beautiful nature tourism sites. The Ghagra Waterfalls, hilly terrain, Tarafeni River Dam, dense forest and the city around are the major attractions to this place. The Laljal hills are situated here. As the hills are red, the water flowing from here seems to be red which is very attractive.

LITERATUTE REVIEW:

Geotourism is a relatively new concept. Actually geotourism is a fusion of three forms of tourism i.e. ecotourism, nature tourism and sustainable tourism. Geotourism may be defined as: 'best practice' tourism that sustains, or even enhances, the geographical character of a place, such as its culture, environment, heritage, and the well-being of its residents (National Geographic, 2002). Geotourism is environmentally sustainable, economically valuable and culturally responsible.

Various research articles, journals, books and different web papers have been consulted. In the article "Tourism in Chabahar, an Opportunity for Sustainable Development (With Emphasis on Geotourism)" entitled by Akbari and Moradpoor (2014) described the natural, historical and cultural attracting features of chabahar (Iran) have the unique potentiality to develop geotourism. Geotourism is one form of sustainable tourism, may protect these attracting features and on the other hand it can develop the local economy of the region by promoting sustainable tourism.

Boley *et al*. (2016), briefly analyzed the geotourism's uniqueness as a market segment within sustainable tourism and also highlighting its differences from ecotourism. A critical examination of the academic literature was used to determine as geotourism's definition is unique or just ecotourism with a new name. Geotourism is focusing on the working landscape of the region. Geotourism is not bounded by a protected area, but ties sustainability to all aspects of the region. Geotourism is a holistic form of sustainable tourism incorporating various types of sustainable tourism segments such as ecotourism, community-based tourism, integrated rural tourism, cultural heritage tourism and nature tourism.

Allan (2013) in his paper “Geotourism: the potential of geotourism development in the United Arab of Emirates” have discussed the concept of geotourism and explored the potentiality of geotourism development in the UAE. The UAE have varied beautiful landscape which have vast potentiality for geotourism promotion. The potential benefits of geotourism can include: enhancing the local economy; raising the geological awareness; improving the wellbeing of the local communities etc.

Boškov *et al.*, (2015) have stated high concentration of geosites of Bela Crkva municipality which have significant value of scientific, educational, aesthetic and touristic importance. These are the result of complex geological structure and geomorphological processes that have taken place during the Earth's history. So, there has a real potentiality for geotourism development in this area. However to attract more tourist in the future, it is essential to develop tourism infrastructure, other promotional activities in these proposed geosites.

However Lima *et al.*, (2013) in the article “Geotourism development in the Azores archipelago (Portugal) as an environmental awareness tool” has been mentioned that geotourism have a wide range of possibilities for sustainably use the geological heritage and geodiversity of Azores archipelago region of Portugal. Geotourism have provided a wide range of Geotourism based products. This paper has also highlighted the importance of geotourism as a tool to promote and preserve the heritage sites of the Azores and on the other hand it is an important instrument of environmental awareness through the local and foreign people.

In 2016, Maksoud and Hussien in their article “Geotourism in Egypt and its Economic and Culture Impact” has pointed out the various attracting historical, religious and geological sites of Egypt. So, development of geotourism in Egypt can provided huge opportunity such as: employment generation, sources of income, increasing gross domestic product, and attracting a lot of investments which are the most important economic development factors of a country. It can also promote the local products and at the same time raising local public as well as visitors’ awareness about the importance of these landscape.

In the article, “Geomorphosite assessment for geotourism purposes”, Kubalíková (2013) have been examined the relationship between geodiversity, geoheritage and geotourism. He mentioned several assessment methods for geotourism purpose and also analyzed and discussed these

methods. The assessment results can serve as a basis for proper use and management of valuable geoheritage sites. To find out which method is appropriate for geotourism purposes, it is essential to know the definitions and principles of geotourism.

Allan (2014) referred the gap in the geotourism literature to find out the motivations of children engaging in a geotourism activity. In this purpose to investigate the motivations of children to travel a specific geosite, he studies the motivation of children to visit the Dead Sea in Jordan in 2012. The result indicates that the main motivation in the Dead Sea were 'enjoyment', 'to escape from the pressures of the study', 'friendship' and 'relaxation'. The study also revealed that the Internet is the primary source to gain necessary information before visiting a particular site.

Community participation is a main tool for geotourism development and geoconservation of geoheritages. In the article "Community Involvement in Geoconservation: A Conceptual Approach Based on the Geoheritage of South Angola", Tavares *et al.*, (2015) have suggested a conceptual community-based model which will be relevant for geoconservation purpose in the African regions. Involvement of local community in all geoconservation procedures such as inventory, evaluation, conservation, valuation and monitoring etc. is the prerequisite to successfully protect the geoheritage. Continuous integrated communication strategy is the best way to obtain this goal. Two case studies are carried out in Tundavala and the Leba geosites to describe the significance of community involvement in geoheritage assessment and conservation processes for understanding the Earth's geological history. For the assessment of geoheritage a multidisciplinary approach was followed which was proposed by Pena dos Reis and Henriques. Both social and scientific components were considered in geoheritage evaluation procedures. Several methods were used for geoheritage assessment such as geological study of the area; questionaries, interviewing to the local residents and visitors to identify their perceptions regarding the conservation of geosite and its geotourism potential and also find out their motivations for visiting the geosites. The results show that both geosites have demonstrated different geoheritage value with local and regional relevance based on the recognition of its symbolic content, iconographic content, documental content, scenic content. The community-based geoconservation model may able to effectively conservation and management of geoheritage and promote local economic development and empowerment based on increasing knowledge base, effective communication strategies and also involvement stakeholder.

According to Ngwira (2015), geotourism is an international developing educational, economic and sustainable rural development investigation field. In the article "Geotourism and Geoparks: Africa's Current Prospects for Sustainable Rural Development and Poverty Alleviation", he elucidates current literature on geotourism and geoparks and also explain their role in sustainable rural development and poverty alleviation. Geotourism and geopark have been recognized as tools for directly and indirectly involved local community in different geotourism activities on the one hand and given an opportunity for sustainable rural development and poverty alleviation on the other. Geotourism is a holistic approach to sustainable tourism promotion and has immense possibility to fight against poverty, unemployment and migration through engaging local communities in geopark activities.

In the paper "Geodiversity, geoconservation and geotourism in Hong Kong Global Geopark of China", Lulin Wang, *et al*., (2015) have analyzed the geodiversity, geoconservation and geotourism of HKGG. This paper deals with efficient conservation management, an optimized tourism infrastructure, a strong scientific interpretation system, mass promotion and education materials, active exchange with other geoparks, continuous training, and effective collaboration with local communities. This valuable information for preserving geoheritage and developing geotourism can help geoparks in the primary stage of development in China and other countries.

Thomas A. Hose (2011), in his paper "The English Origins of Geotourism (as a Vehicle for Geoconservation) and Their Relevance to Current Studies" published from Acta geographica Slovenica, contextualizes the recognition of the geotourism concept and stresses the underpinning geoconservation purpose that drove its development in England and also provides a synopsis of the development of early modern geoconservation in England . The evolving geotourism research approach and its impact on its understandings, definitions and models are also remarked within the framework of special interest tourism.

Another paper named "Geotourism in Almeria Province, Southeast Spain" Thomas A. Hose (2007) summarizes and analyses geotourism provision in Almeria Province, southeast Spain. It also examines the management issues for geotourism in fragile landscapes. Finally, it indicates the role that such provision can play in the broader context of environmentally and economically sustainable tourism in Spain's Mediterranean coastlands.

Community participation is a main tool for geotourism development and geoconservation of geoheritages. In the article "Community Involvement in Geoconservation: A Conceptual Approach Based on the Geoheritage of South Angola", Tavares et al. (2015) have suggested a conceptual community-based model which will be relevant for geoconservation purpose in the African regions. Involvement of local community in all geoconservation procedures such as inventory, evaluation, conservation, valuation and monitoring etc. is the prerequisite to successfully protect the geoheritage. Continuous integrated communication strategy is the best way to obtain this goal. Two case studies are carried out in Tundavala and the Leba geosites to describe the significance of community involvement in geoheritage assessment and conservation processes for understanding the Earth's geological history. For the assessment of geoheritage a multidisciplinary approach was followed which was proposed by Pena dos Reis and Henriques. Both social and scientific components were considered in geoheritage evaluation procedures. Several methods were used for geoheritage assessment such as geological study of the area; questionaries, interviewing to the local residents and visitors to identify their perceptions regarding the conservation of geosite and its geotourism potential and also find out their motivations for visiting the geosites. The results show that both geosites have demonstrated different geoheritage value with local and regional relevance based on the recognition of its symbolic content, iconographic content, documental content, scenic content. The community-based geoconservation model may able to effectively conservation and management of geoheritage and promote local economic development and empowerment based on increasing knowledge base, effective communication strategies and also involvement stakeholder.

RELEVANCY OF THEME:

Geotourism refers to tourism to the geosites satisfying the agenda of geodiversity conservation as well as an understanding of earth sciences through appreciation and learning. It is a new concept and most dictionaries do not offer a meaning for this term (Joyce, 2006). The geotourism research database and literature are also scant because of the lack of qualitative and quantitative studies (Allan, *et al.*, 2015). In case of my study area, there is an immense scope of geotourism development because the presence of different geosites. There are present many residual hills, Badlands, rock outcrops, waterfalls and riverine tracts which may attract the visitors. Economically South-Western Districts of West Bengal is a backward area and the common

people residing in the region are suffering from extreme poverty. Tourism can contribute positively in the economy of the region by its multiplier effects on income and employment. Some parts of the region have also earned the bad name as disturbed area due to extremist activities. It is alleged that poverty has driven the tribal people to join with the extremists. Tourism can contribute positively in the economy of the region by its multiplier effects on income and employment. The efforts in this context have already been made through promoting nature tourism, wildlife tourism and cultural tourism by governmental and non-governmental agencies, which are found partly successful in some isolated pockets. It is noteworthy to mention that in many developing countries where millions of people are still living in poverty, governments are directed to integrate sustainability as a new paradigm for development aiming to poverty eradication. Geomorphosites like the waterfalls, residual hills, Badlands, riverine tracts etc. possess not only an immense scientific value but also gain a considerably high economic value in terms of tourism return (Chakrabarty and Mandal, 2018). Geotourism is a relatively new concept to be implemented, which probably has the maximum potentialities in the context due to availability of a number of geosites throughout the study area. Due to the ignorance of local people and lack of proper knowledge about geoconservation many geomorphosites are degraded day by day. Geotourism is very much beneficial in this context. It can conserve geosites and imparting education to the visitors and at the same time it can improve the local economy. Though there is a huge scope of geotourism promotion, but little research work is done yet in this field. In this context, this research work will be effective to address the research gap and contribute in the development of geotourism in the region from community oriented sustainable planning perspective.

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